

WHAT IS CLAIMED IS:

1. A differential response-type light-receiving device comprising: a semiconductor electrode comprising an electrically conductive layer and a photosensitive layer containing a semiconductor sensitized by a dye; an ion-conductive electrolyte layer; and a counter electrode, said differential response-type light-receiving device making time-differential response to quantity of light to output a photoelectric current.

5 2. The differential response-type light-receiving device according to claim 1, wherein said ion-conductive electrolyte layer is free of redox species.

10 3. The differential response-type light-receiving device according to claim 1, wherein said semiconductor is a metal chalcogenide.

15 4. The differential response-type light-receiving device according to claim 3, wherein said semiconductor is a metal oxide selected from the group consisting of  $\text{TiO}_2$ ,  $\text{ZnO}$ ,  $\text{SnO}_2$  and  $\text{WO}_3$ .

20 5. The differential response-type light-receiving device according to claim 2, wherein said differential response-type light-receiving device comprises a plurality of semiconductor electrodes, photosensitive wavelengths of said plurality of semiconductor electrodes being different from each other, and said ion-conductive electrolyte layer is disposed between said plurality of semiconductor electrodes and said counter electrode.

25 6. The differential response-type light-receiving device according to claim 5, wherein said plurality of semiconductor electrodes are arranged in such order that said photosensitive wavelengths are increasing from light incident side of said differential response-type light-receiving device.

7. The differential response-type light-receiving device according to claim 6, wherein said plurality of semiconductor electrodes comprises a blue-sensitive semiconductor electrode, a green-sensitive semiconductor electrode and a red-sensitive semiconductor electrode arranged in this order from said light incident side of said differential response-type light-receiving device.

8. A composite light-receiving device comprising the differential response-type light-receiving device recited in claim 1 and a stationary response-type light-receiving device.

9. The composite light-receiving device according to claim 8, wherein said differential response-type light-receiving device and said stationary response-type light-receiving device are stacked.

10. The composite light-receiving device according to claim 8, wherein said stationary response-type light-receiving device comprises: a semiconductor electrode comprising an electrically conductive layer and a photosensitive layer containing a semiconductor sensitized by a dye; a charge transfer layer comprising a hole-transporting material or an electrolyte composition containing redox species; and a counter electrode.

11. The composite light-receiving device according to claim 10, wherein said semiconductor is a metal chalcogenide.

12. The composite light-receiving device according to claim 11, wherein said semiconductor is a metal oxide selected from the group consisting of  $\text{TiO}_2$ ,  $\text{ZnO}$ ,  $\text{SnO}_2$  and  $\text{WO}_3$ .

13. The composite light-receiving device according to claim 10, wherein said stationary response-type light-receiving device comprises a plurality of semiconductor electrodes, photosensitive wavelengths of said plurality of semiconductor electrodes being different from each other, and said charge transfer layer is disposed between said plurality of semiconductor electrodes and said counter electrode.

14. The composite light-receiving device according to claim 13, wherein said plurality of semiconductor electrodes are arranged in such order that said photosensitive wavelengths are increasing from light incident side of said composite light-receiving device.

15. The composite light-receiving device according to claim 14, wherein said plurality of semiconductor electrodes comprises a blue-sensitive



semiconductor electrode, a green-sensitive semiconductor electrode and a red-sensitive semiconductor electrode arranged in this order from said light incident side of said composite light-receiving device.

16. An image sensor comprising a plurality of pixels, wherein each of said pixels comprises the differential response-type light-receiving device recited in claim 1 or the composite light-receiving device recited in claim 8.

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